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A FRAMEWORK FOR THE DEVELOPMENT OF
ARABIC LANGUAGE MORPHOLOGY

MARIA BINTI MOHAMMAD ISHAK

This project is submitted
in partial fulfillment of the requirements for a
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Received for the examination by:

.....

(Ahmad Sofian bin Shminan)

Date:

15th June 2015

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ABSTRACT

Learning Arabic Language (AL) as the second language is crucial for the people and to increase the vocabulary of AL, they need to learn the language morphology. Thus, this study aims to increase the learner's vocabulary in AL by producing an e-Learning website for learning morphology of AL. This study also means to design, develop contents and integrate multimedia elements on the e-Learning. Besides, this study wants to evaluate the usability of e-Learning user interface and contents for the morphology of AL.

This study used the valuable skills such as XAMPP software to enable Apache/MySQL/PHP (AMP) setting, Learning Management System (LMS), eFront as the platform to build the e-Arabic Learning website and the course contents were designed using authoring tool, Articulate Storyline 2. Besides, the technique of SCORM was applied to integrate the contents into the learning platform. Two methods were used during the formative evaluation; Think Aloud Protocol (TAP) and interview in order to get the respondents' feedback to do iterative improvement for the e-Arabic Learning website. Three respondents were chosen for the data collection.

At the end of the study, the e-Arabic Learning website was developed and the contents were designed based on the Mayer's six media element principles. Some limitation and recommendation for the future work were also addressed by the researcher.

Keywords: Arabic Language morphology, e-Learning, e-Arabic Learning, LMS, eFront, SCORM, authoring tool, Articulate Storyline 2

ABSTRAK

Pembelajaran Bahasa Arab (BA) sebagai bahasa kedua adalah penting untuk manusia dan untuk meningkatkan perbendaharaan kata dalam BA, mereka perlu mempelajari morfologi bahasa tersebut. Oleh itu, kajian ini bertujuan untuk meningkatkan perbendaharaan kata pelajar BA dengan menghasilkan sebuah laman web e-Pembelajaran untuk mempelajari morfologi BA. Kajian ini juga bertujuan untuk mereka bentuk, membangunkan isi kandungan dan mengintegrasikan elemen-elemen multimedia dalam e-Pembelajaran. Selain itu, kajian ini mahu menilai kebolegunaan antara muka pengguna e-Pembelajaran dan isi kandungannya untuk morfologi BA.

Kajian ini menggunakan kemahiran yang berharga seperti perisian XAMPP untuk membolehkan tetapan Apache/MySQL/PHP (AMP), Sistem Pengurusan Pembelajaran, eFront sebagai platform untuk membina laman web e-Arabic Learning dan telah mereka kandungan kursus dengan menggunakan alat pengarang, Articulate Storyline 2. Selain itu, teknik SCORM telah digunakan untuk mengintegrasikan kandungan yang telah dibina ke dalam platform pembelajaran. Dua kaedah telah digunakan semasa penilaian formatif; Think Aloud Protocol (TAP) dan temuduga untuk mendapatkan maklum balas responden untuk membaik pulih laman web e-Arabic Learning secara berulang. Tiga orang responden telah dipilih untuk tujuan pengumpulan data.

Pada akhir kajian ini, laman web e-Arabic Learning telah dibangunkan dan isi kandungannya telah direka berdasarkan enam prinsip elemen media Mayer. Beberapa limitasi dan cadangan untuk kajian di masa hadapan juga telah diusulkan oleh pengkaji.

CHAPTER ONE

INTRODUCTION

Nowadays, the demand to learn Arabic Language (AL) as a second language is increasing as stated by Rad (2014) and there is increment in AL learning enrolments. Learning AL is challenging as it is a language that has complex linguistics structure, morphology and complex Diglossia situation. Besides, it is written from right to left unlike English, no capitalization in Arabic, the Arabic letters change its shape according to their position in word and Arabic language also allows subject pronouns to drop subject to recoverability of deletion (Farghaly & Shaalan, 2009). Morphology is one of the main studies in AL that need to be considered by the learners which can be defined as the study of the internal structure of words and the rules of words formation.

Farghaly and Shaalan (2009) have listed several works that have been done by previous study on the field of morphology and morphological analysis such as MAGEAD system, The Xerox Arabic Morphological Analyzer Generator and Sarf engine. These Arabic Morphological Analyzers showed us the importance of morphology in this unique language. Benaïda (2014) stated that, to understand an Arabic sentence, a person must consider the morphology and the sentence structure and be fully sensitive of the words meaning.

As mentioned by Benaïda (2014, p.82), morphology in AL is “focuses on building a word in terms of weight increase or decrease and ensures that it knows the difference between the types of derivation and the action of the act.” Besides, morphology also “provides rules for changing a word from one format to another in order to get new meaning” (Benaïda, 2014, p.82). The knowledge gained from derivational words that produced by the morphology help to increase the vocabulary in AL of learner.

However, there are some factors that limit a learner to learn AL as a second language in face to face classrooms learning. Rad (2014, p.1) stated that, “many adults who want to learn a second language are challenged by lack of time, location flexibility and convenient access”. Same goes to the people who want to improve their AL knowledge might be lack from the traditional learning. Rad (2014) also mentioned that technology needs to be applied in language learning and teaching method as there are raising in AL learning enrolments and shortage of qualified teachers. Thus, modern learning method which is assisted by technology will be able to overcome the limitations.

Modern learning these days is aided by the Internet to enhance distance learning. Distance learning does not require the person to be at the place where the teaching is conducted. Moreover, the traditional learning methods where the learning occurs in the classroom and taught by the teacher are mostly replaced with the modern learning method using e-Learning in this era of technology. Clark (2002, p.2) defined e-Learning as “content and instructional methods on computer weather via CD-ROM, the Internet or an Intranet and designed to build knowledge and skills related to individual or organizational goals.”

In addition, there are some related studies that are using technology in the AL learning to enhance the learners learning process such as Erradi, Nahia, Almerexhi and Al-kailan in 2012. Their aim of study is to leverage mobile-supported learning trough game to ease AL learning for spelling and vocabulary. Rad in his work in 2014 also focuses on the mobile-learning application to investigate the effectiveness of the mobile-learning with student’s achievement motivation. Other than that, Sahrir and Alias in 2011 have studied the Arabic vocabulary learning perceptions via online games that showed the significance of technology in modern learning method.

For this reason, producing an educational module of AL morphology that can be accessed via computer is essential to fulfill the needs of AL learning as a demand today. The main references for the framework are based on educational Arabic website and also two AL books that discussed the morphology by Muhammad Hamzah Sittar, the writer of *الألف والياء* (Tasrif Bina' Al-Af'al) book and Muhammad Maksum Ali, the writer of *الألف والياء* (Al-Amsilah Al-Tasrifiah) book. However, before learning about AL morphology, the first learner have to learn about the basic of AL such as AL characteristics and its pronunciations. Besides, the researcher have to refer to reliable educational website of AL. The contents on the two books and the Arabic website is chosen based on its relevance and appropriateness.

THE PRESENT STUDY

Several gaps are stressed out in this present study as the Arabic Language (AL) is a unique language and has big demand to be learned as a second language. AL is unique in its linguistics structure, morphology, and its scripts. Morphology of AL plays a very important role where it derives words with different meaning (Farghaly & Shaalan, 2009). Besides, a lot of works develop Arabic Morphological Analyzer that have been done previously showed us the importance to learn Arabic morphology as it able to add Arabic vocabulary.

Even though there are many related studies on AL, most of them only focused on the AL vocabulary and not specified on the morphology. Moreover, most of the previous studies proposed AL learning on mobile phone and game-based learning not web-based learning. The limitations appeared in learning AL as stated by Rad (2014) will lead to the decrease of learner motivation to learn AL as a second language.

Hence, producing an educational module that can be accessed anytime and anywhere is necessary to overcome the limitations faced by learner. Furthermore, the development of web-based learning that focused on Arabic morphology is also required in order to help the learner to gain more vocabulary in AL. Besides, the implementation of multimedia to enhance the learning process needs to be considered in the development phase.

In general, the scope of the study is mainly focused on the non-native Arabic Language (AL) among UNIMAS students. Non-native AL person does not mean he or she does not know anything about the language but it is only he or she lacks of the language knowledge. The study also proposed to employ modern learning method by producing e-Learning website where the AL morphology is mainly highlighted.

As a conclusion, the objectives of the study are listed below:

1. To increase the learner's vocabulary in AL by producing e-Learning website for learning morphology of AL.
2. To design, develop contents and integrate multimedia elements on e-learning website for AL morphology.
3. To evaluate the usability of e-Learning website user interface and contents for morphology of AL.

Following questions are also addressed for the study purposes:

1. How to design good contents of e-Learning website for learning morphology of AL?
2. What are the appropriate media elements to be integrated on the e-Learning website?
3. What are the reliable contents of e-Learning website for learning AL morphology?
4. How the user interface and contents of e-Learning website developed will interact with the user during the learning process of AL morphology?

CHAPTER TWO

LITERATURE REVIEW

Challenges in Learning AL

Learning AL as a second language is challenging with its complex linguistics structure, morphology, it has complex Diglossia situation, it is written from right to left unlike English, no capitalization in Arabic, the Arabic letters change its shape according to their position in word and Arabic language also allows subject pronouns to drop subject to recoverability of deletion (Farghaly & Shaalan, 2009). As listed earlier, the morphology of AL plays a very important role as stated by Farghaly and Shaalan (2009) where this Arabic is highly structured and a derivational language.

Morphology of AL

Morphology is one of the main studies in AL that need to be considered by the learner as it can be defined as the study of the internal structure of words and of the rules by which words are formed. The knowledge of morphological is the knowledge of the rules that combine the individual morphemes into complex words. As mentioned by Farghaly and Shaalan (2009, p.13) “in 1987, Farghaly had proposed a three tier Arabic morphology by adding a third level for catenative affixation to Arabic stems.” Basically, there are four types of affixation in morphology which are prefixes (precedes or before), suffixes (follow after), infixes (inserted) and circumfixes (begin and end). Applying this affixation to Arabic stems help to produce various meaning words of AL.

Besides, “morphology focuses on building a word in terms of weight increase or decrease and ensures that it knows the differences between the types of derivation and the action of the act” (Benaïda, 2014, p.82). Benaïda (2014, p.82) also stated that “morphology

provides rules for transforming a word from one format to another in order to get a new meaning” as represented on the following figure.

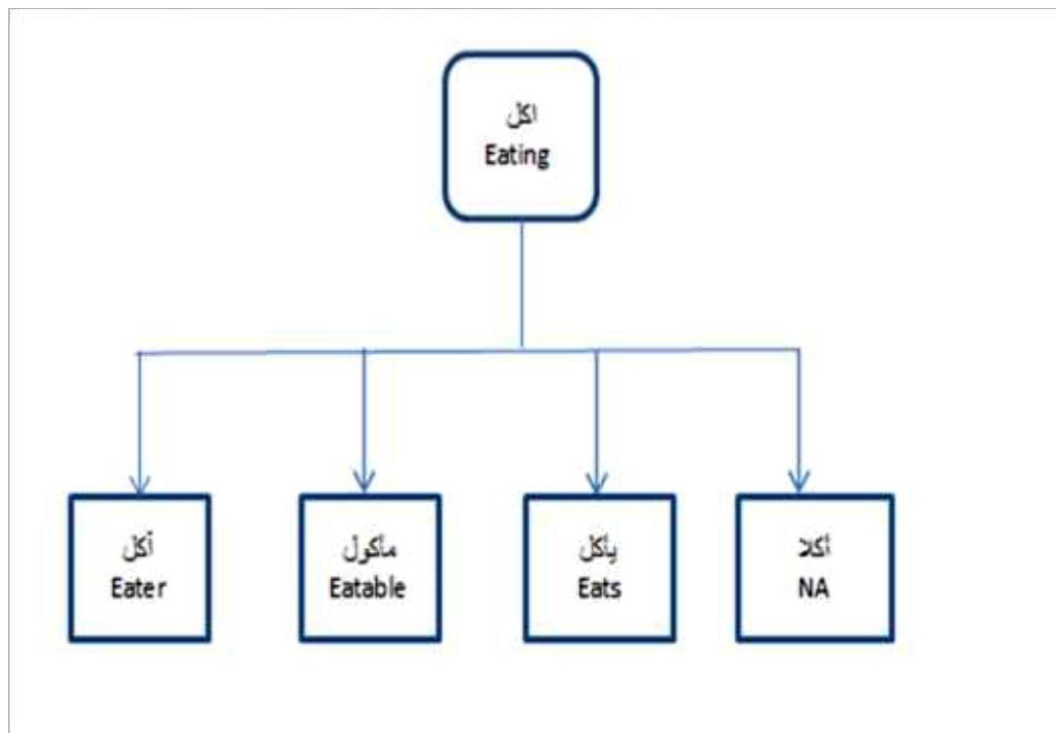


Figure 1. The formation of words from a single word that act as the root into another words known as the derivational words.

Based on the figure 1, the word **أكل** acts as the root word. Meanwhile, the words **أَكَلَ**, **مَأْكُول**, **يَأْكُلُ** and **أَكَلَ** are the derivational words from the root. The affixation either prefixes, suffixes, infixes or circumfixes on the root word tends to produce different words with different meaning. Thus, the morphological knowledge is important to rich AL learner’s vocabulary.

AL Morphology Increases Learner’s Vocabulary

The derivational words that obtained from the morphological knowledge help to increase the learner’s vocabulary. “Vocabulary is an essential building block of language and it makes sense to be able to measure learners’ knowledge and use of it” (Coombe, 2011, p.3).

The vocabulary on a language has the same importance with its morphology as mentioned by Coombe (2011, p.3) “that vocabulary is central to the language learning process”. Therefore, improving the knowledge on AL morphology also enhance the additional knowledge of AL vocabulary as the second language.

The Important of AL Morphology

Farghaly and Shaalan (2009) have listed several works that have been done by previous study on the field of morphology and morphological analysis such as MAGEAD system, The Xerox Arabic Morphological Analyzer Generator and Sarf engine.

“In the MAGEAD system, an Arabic lexeme is defined as a root, a meaning index and a morphological behavior class and this definition that allows operation without lexicon” (Farghaly & Shaalan, 2009, p.15). MAGEAD system is also important for morphological analyzer and generator for Arabic dialects.

The Xerox Arabic Morphological Analyzer Generator was developed in the 1990’s by Ken Beesley where it is recovers Arabic roots and performs both analysis and generation. Besides, Arabic words can be entered using the Arabic script in this generator.

Meanwhile, Farghaly and Shaalan (2009, p.17) mentioned that the Sarf as “an engine that can generate Arabic verbs, nouns, gerunds, adjectives from their roots”.

All the Arabic Morphological Analyzers stated earlier had shown us the importance of morphology in this unique language. Benaïda (2014) also stated that, to understand an Arabic sentence, a person must consider on its morphology and sentence structure and be fully sensitive of the words meaning.

Limitations in Learning AL

Learning AL is not only challenged by the complexity of the linguistics itself, another physical barrier also tend to become a limitation for a person to learn AL. “Many adults who want to learn a second language are challenged by lack of time, location flexibility and convenient access” (Rad, 2014, p.1). Besides, the traditional learning by learning AL face to face in the classrooms can affect the learning process where some knowledge might not be delivered successfully. Moreover, Rad (2014) mentioned that technology needs to be applied in language learning and teaching method as there are rising in AL learning enrolments and shortage of qualified teachers. Hence, modern learning method assisted by technology will be able to overcome the limitations.

Web-based Learning for AL

Modern learning these days is aided by the Internet to enhance distance learning. Distance learning does not require the person to be on the place where the teaching is conducted. Moreover, the traditional learning method which occurs in the classroom and taught by the teacher is replaced by the modern learning method using e-Learning in this era of technology. Clark (2002, p.2) defined e-Learning as “content and instructional methods on computer weather via CD-ROM, the Internet or Intranet and designed to build knowledge and skills related to individual or organizational goals.”

Nowadays, “web-based learning is becoming even more influential interactive source that can enlarge learner’s knowledge and guarantee quantity and quality of language input and output” (Pacheco, 2005, p.2). Besides, Pacheco (2005, p.5) stated that web-based learning “support the changes from traditional teacher-centered classroom to learner-centered environment” where all the learning process is experienced by the learner without existence of the teacher. Developing a web-based learning is necessary in order to overcome the

limitations which are previously stated, as it provides benefits to the person who desires to learn AL.

Some of the benefits for developing web-based learning for AL morphology is the activities offered in the website such as tutorials, exercises, simulations and learning tools are highly interactive to develop learner's understanding of other's ideas and the articulation of their own. Besides, Pacheco (2005) claimed that the web also can provide flexibility in teaching and learning, not limited with the physical boundaries of classrooms and the class timetable. Other than that, the web benefits the students who passive in the class to be active in the online learning environment. Moreover, through the web the learners have the opportunities to request information and exchange ideas from other learners which enhance the interactive learning.

Mayer's Six Media Element Principles

Previous study done by Clark (2002), there are six media element principles of Mayer has been discussed as the guidelines for trainer to design the e-Learning courses effectively to enhance learning and avoid learning suffer.

The multimedia principle. The first Mayer's media principle is multimedia principle where the graphics aided to words can improve learning. In the psychology perspective, learning occurs by the encoding of novel information in lasting memory called long-term memory. Clark (2002, p.3) mentioned that Dual Encoding theory where the content communicated with text and graphics sends two codes (a verbal code and a visual code). Thus, by having both codes help in learning where the long-term memory encodes the information permanently.

The contiguity principle. The second principle, contiguity principle suggests that the text placed close to graphics improves learning. “Contiguity refers to the alignment of graphics and text on the screen” (Clark, 2002, p.3). According to Clark (2002), this principle benefits in the psychology part for working memory capacity where it can only hold seven (plus or minus two) facts or items at a time. The contiguity principle helps the learner by doing the integration of the information by placing the words and graphics contiguously.

The modality principle. Third principle which is modality principle suggests graphics explanation by audio to improve learning. “Cognitive psychologists have learned that working memory has two sub-storage areas- one for visual information and one for phonetic information” (Clark, 2002, p.4). Therefore, both storage areas should be utilized in order to stretch the capacity of working memory.

The redundancy principle. Even the multimedia elements are used to get the learner’s attraction, the redundancy principle cannot be ignored in developing the e-Learning. This forth principle stated that explaining graphics with audio and redundant text can hurt learning. Thus, a graphic which is explained by a combination of text and narration that reads the text should be avoided.

The coherence principle. The fifth principle explained that the usage of gratuitous visuals, text and sounds can hurt learning.

The personalization principle. The last media element principle of Mayer is the personalization principle where conversational tone and pedagogical agents are used to improve learning (Clark, 2002, p.6).

Hence, these Mayer’s six media element principles should be made as a guideline for the researcher in designing and developing the e-Learning later.

Review of existing studies for learning AL

There are some related studies that are using technology in the AL learning to enhance the learners learning process such as Erradi, Nahia, Almerekhi and Al-kailan in 2012. Their aim of study is to leverage mobile-supported learning through game to ease learning AL for spelling and vocabulary. Rad in his work in 2014 focused on the mobile-learning application to investigate the effectiveness of the mobile-learning with student's achievement motivation. Other than that, Sahrir and Alias in 2011 have been studied on the Arabic vocabulary learning perceptions via online games. Therefore show the significance of technology in modern learning method.

Table 1

Comparison of the Previous Studies on AL learning

Researcher(s)	Learning approaches	Purpose	Weaknesses
Erradi, Nahia, Almerekhi and Al-kailan (2012)	<ul style="list-style-type: none">• Mobile-supported learning.• Game-based learning.	Spelling and vocabulary learning of AL.	-There is no any platform used to design and deliver the learning content.
Rad (2014)	<ul style="list-style-type: none">• Mobile-learning application.	Students' achievement motivation in AL course.	-Focus only on the mobile application used in learning and teaching method.
Sahrir and Alias (2011)	<ul style="list-style-type: none">• Web-based learning.• Game-based learning.	Vocabulary learning of AL.	<ul style="list-style-type: none">-Only focuses on the vocabulary learning.-The role of teacher is still needed to maintain the user's assessment.

Arabic Language Morphology Module

Arabic language. As mentioned earlier, learning AL as the second language is quite challenging due to its complex linguistics structure, its different ways of writing and reading, and the changes of each AL characters in terms of its shape based on the position in word (Farghaly & Shaalan, 2009). For the first learner, recognizing the AL characters and its pronunciation is crucial to let the learning process enjoyable and understandable. An educational website named myeasyarabic.com is used as a reference and the contents are used to be included on the module. In order to enhance the learning process, a test on this lesson is provided by the researcher. Besides, the basics of AL and a quiz session to test the user's learning are included in the module of e-Arabic learning website.

Arabic language morphology. Besides of the main purpose of the study, the contents of AL morphology is referred from **تصريف بناء الأفعال** (Tasrif Bina' Al-Af'al) book by Muhammad Hamzah Sittar, and **الأمثلة على التصريفات** (Al-Amsilah Al-Tasrifiah) book written by Muhammad Maksum Ali which are both discussing about the AL morphology. The relevant contents are chosen from the books based on the expert's advice as the module will only include the basic of AL morphology. Basically, the module consists of six rules of AL morphology which will be explained more in chapter four. The researcher wants to deliver simpler contents on AL morphology yet still useful to be learned. A quiz to test the learner's AL morphology knowledge also included as one of the learning activities.

Summary

As a summary in this chapter, the challenges in learning AL and the introduction about the morphology especially how AL morphology can increase the learner's vocabulary show the importance to learn the matters. The importance of AL morphology is proven where